IN THE CLAIMS:

The following list of claims replaces all prior listings and versions of claims in this application:

1. (Amended) A method of preparing a semiconductor wafer, comprising:

growing a first layer of a first material on a matching substrate comprising a matching layer;

growing a second layer of a semiconductor second material, different from the first material, in a relaxed state on the first layer to form a boundary between the first and second layers and to form a composite structure which comprises the matching, first, and second layers, wherein the first and second layers each have substantially the same first lattice parameter;

creating a region of weakness in the matching substrate to facilitate splitting; and

removing the first layer from the second layer to produce a surface ~~boundary~~ on the second layer that is substantially smooth and of substantially uniform thickness.

2. (Original) The method of claim 1, where the first layer is grown in a strained state.

3. (Original) The method of claim 1, wherein the matching layer has the lattice parameter where it contacts the first layer that is substantially the same as the first lattice parameter of the first layer.

4. (Original) The method of claim 1, further comprising growing the matching layer on a handling substrate that has a second lattice parameter that is different from the first lattice parameter.

5. (Original) The method of claim 1, wherein the matching layer includes a buffer layer and a relaxed surface layer.

6. (Original) The method of claim 5, wherein the lattice parameter of the matching layer is graded between the first and second lattice parameters.

7. (Original) The method of claim 6, wherein the region of weakness is created in a portion of the matching layer that is in a substantially relaxed state.

8. (Original) The method of claim 1, further comprising splitting the composite structure into:

an unfinished wafer that includes the second layer, and

a handle wafer that includes a portion of the matching layer.

9. (Original) The method of claim 8, wherein the composite structure is split such that the unfinished wafer includes the first layer.

10. (Original) The method of claim 8, further comprising associating a receiving substrate with the second layer of the composite structure prior to splitting.

11. (Original) The method of claim 10, wherein the receiving substrate is bonded to the second layer.

12. (Original) The method of claim 1, further comprising providing an insulator between the second layer and receiving substrate.

13. (Original) The method of claim 1, wherein the region of weakness is created by implanting atomic species.

14. (Original) The method of claim 1, wherein the region of weakness is created by adding a porous layer.

15. (Original) The method of claim 1, wherein the first layer is strained to impart the first lattice parameter.

16. (Original) The method of claim 15, wherein the lattice parameter of the first material when strained is different than the lattice parameter of the first material in a relaxed state.

17. (Original) The method of claim 1, further comprising:

splitting the composite structure into:

an unfinished wafer that includes the second layer and at least a remaining portion of the matching layer, and

a handle wafer; and

removing the remaining portion of the matching layer from the unfinished wafer.

18. (Original) The method of claim 17, wherein the first layer is removed by etching.

19. (Cancelled)

20. (Original) The method of claim 1, wherein the boundary with the first layer removed is sufficiently smooth for growing a substantially uniform and substantially smooth device layer thereon of a semiconductor material that is different from that of the second layer and that has a lattice parameter that is adapted to match that of the second layer.

21. (Original) The method of claim 1, wherein the first material is a semiconductor.

22. (Amended) The method of claim 1, further comprising growing a device layer on the ~~boundary~~ surface.

23. (Original) The method of claim 1, wherein the region of weakness is created at a depth from the second layer sufficient for substantially preventing damage to the second layer.

24. (Original) The method of claim 23, wherein a damaged region in the matching substrate and outside the second layer is created adjacent the region of weakness by the creation of the region of weakness.

25. (Original) The method of claim 1, wherein the matching layer and the second layer comprise silicon germanium.

26-33. (Cancelled)

34. (Original) A method of preparing a semiconductor wafer, comprising:

growing a first layer of a first material on a matching substrate comprising a matching layer;

growing a second layer of a semiconductor second material, different from the first material, in a relaxed state on the first layer to form a boundary between the first and second layers and to form a composite structure which comprises the matching, first, and second layers, wherein the first and second layers each have substantially the same first lattice parameter;

creating a region of weakness in the matching substrate to facilitate splitting;

splitting the composite structure into:

an unfinished wafer that includes the second layer and at least a remaining portion of the first layer, and

a handle wafer that includes a portion of the matching layer;

thickening the remaining portion of the first layer.

35. (Original) The method of claim 34, wherein the composite structure is split such that the unfinished wafer includes the a remaining portion of the matching layer, the

method further comprising removing the remaining portion of the matching layer prior to the thickening of the remaining portion of the first layer.

36. (New) The method of claim 1, wherein the produced surface of the second layer is substantially at said boundary.

37. (New) The method of claim 18, wherein the remaining portion of the matching layer is removed from the unfinished wafer by etching.

38. (New) The method of claim 23, wherein the region of weakness is created by implanting atomic species to said depth.

39. (New) The method of claim 23, wherein the first layer is removed by selective etching.